UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98105

Department of Mathematics

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Professor Joshua Lederberg
Department of Genetics
Stanford University School of Medicine
Stanford Medical Center
300 Pasteur Drive
Palo Alto, California

Dear Professor Lederberg:

Many thanks for letter of February 20, and for the interesting enclosures. I hope that the copy of my report has reached you by now; and, of course, you are quite welcome to quote it as a forthcoming publication. Alternatively, you might simply list the Boeing's Scientific Document number. However, I rather doubt that it will contain much of direct interest to you.

If you should hear of any definite information as to the smallest number of vertices of trivalent polyhedral graphs which do not admit Hamiltonian circuits, I should appreciate your telling me, for a student of mine is working on this problem at present, and is finding it rather difficult. He does have one result which might be of interest to you, and might even be useful in connection with some of your notational schemes. This is the fact that every polyhedral graph can be covered by a tree of valence three; that is to say, every polyhedral graph admits a sub-tree which includes all of the vertices of the graph, but does not include more than three edges incident to any vertex.

In your letter you mentioned the name of Sussenguth. I don't know his work at all, and would be glad to have a reference to it.

The reference to Bouwkamp is contained in my report. However, Bouwkamp does not have any spare copies of his tables nor the facilities for making them. I secured a copy of the tables by writing to Ray C. Ellis, Jr., Raytheon Company, Research Division, Waltham 54, Massachusetts. He has a copy of the tables and was able to send me a Xerox copy of his

J. KLEE

THANK YOU VERY MUCH!

If you mean planar graphs, all I know is $20 \leq n \leq 46$.

I think n is 12 or 14 for *nonplanar* (triply connected). If this point is important, I will retrieve the example. The smallest planar cyclic graph is , $n = 8$; if you include slings: $n = 14$ all of which must be very well known.

J.L.

copy upon the payment of $20.00 (or perhaps it was $25.00, I don't remember for sure). He also has some very useful pictures of a number of the graphs and some systematic way of deciding just what geometric representation to use.

At a meeting of the Society for Industrial and Applied Mathematics, in New York City next June, I shall be giving an hour lecture under the title "Some Unsolved Geometric Problems Arising in Science and Technology." I know of many such problems but am always happy to hear of more so any suggestions from you would be most welcome. Some of the problems which I will discuss are really more combinatorial than geometric in nature, although they can easily be phrased in geometric terms. In this connection you may be interested in a paper by Lekkerkerker and Boland which appeared in the journal, "Fundamenta Mathematicae", volume 51, 1962, pages 45 to 64. This paper was directly stimulated by a question of Seymour Benzer arising in connection with some recombination investigations on the structure of DNA molecules. Actually there are several other publications in graph theory which are also related to Benzer's question, and another of my students is trying to extend these results in certain directions.

Yours cordially,

Victor Klee

Victor Klee

VK:jn
cc: Dr. Donald W. Grace